

Advanced Stirling Regenerator and Heat Exchanger Assembly for Radioisotope Stirling Space Power, Phase I Project

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ABSTRACT

SCCAQ Energy, LLC (SCCAQ), in collaboration with Temple University and Infinia Technology Corporation, proposes to develop an Advanced Stirling Regenerator and Heat Exchanger Assembly to significantly increase the performance and durability of Stirling Power systems to address the need for an efficient and robust Radioisotope Power System for space applications. This assembly will be used to replace the heat exchangers and random fiber regenerator of Technology Demonstration Convertor developed by Infinia Corporation in 1999 to 2006. Proposed Principal Investigator, Dr. Songgang Qiu, was at that time PI and the principal designer for the Infinia Stirling Radioisotope Generator program, under which the TDC was developed. Dr. Qiu was co-PI for the micro-machined involute regenerator project under a NASA GRC contract. The integrated regenerator/heat exchanger assembly will be additively manufactured to increase the efficiency and durability, while reducing the size and weight. The major innovation is additively manufacturing the assembly to have outstanding figure of merit comparable to foil regenerator while improves reliability, better than mesh screen regenerator. The integrated assembly of heat exchangers and regenerator will provide uniform flow throughout the key components to minimize flow separation and flow losses in the plenums and to avoid jetting in the regenerator.

ANTICIPATED BENEFITS

To NASA funded missions:

Potential NASA Commercial Applications: The market for the RSG with ReHX will be initially focused on delivery of NASA space power systems.

To the commercial space industry:

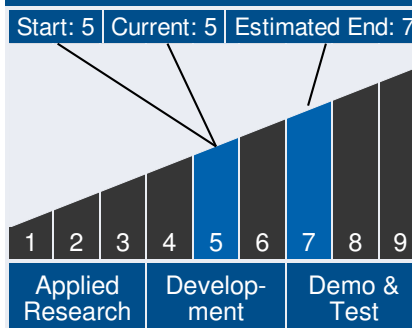
Potential Non-NASA Commercial Applications: The technology



Table of Contents

Abstract	1
Anticipated Benefits	1
Technology Maturity	1
Management Team	1
U.S. Work Locations and Key Partners	2
Technology Areas	2
Image Gallery	3
Details for Technology 1	3

Technology Maturity



Management Team

Program Executives:

- Joseph Grant
- Laguduva Kubendran

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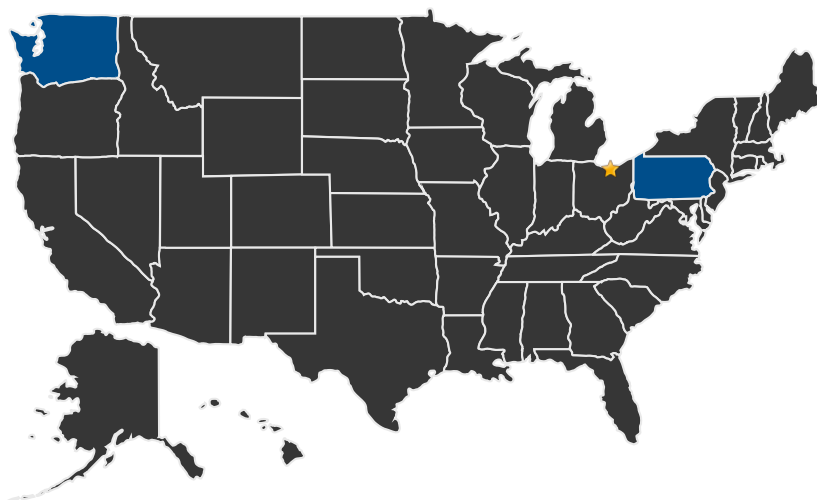
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developed in the proposed system, however, has potential commercial applicability to the remote power and combined heat and power generator line that ITC/Qnergy is pursuing.

U.S. WORK LOCATIONS AND KEY PARTNERS



■ U.S. States
With Work

★ **Lead Center:**
Glenn Research Center

Other Organizations Performing Work:

- SCCAQ Energy, LLC (Richland, WA)
- Temple University (Philadelphia, PA)

PROJECT LIBRARY

Presentations

- Briefing Chart
 - (<http://techport.nasa.gov:80/file/23121>)

Management Team *(cont.)*

Program Manager:

- Carlos Torrez

Principal Investigator:

- Songgang Qiu

Technology Areas

Primary Technology Area:

Space Power and Energy
Storage (TA 3)

- └ Power Generation (TA 3.1)
 - └ Radioisotope (TA 3.1.4)

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IMAGE GALLERY



*Advanced Stirling Regenerator and
Heat Exchanger Assembly for
Radioisotope Stirling Space Power,
Phase I*

DETAILS FOR TECHNOLOGY 1

Technology Title

Advanced Stirling Regenerator and Heat Exchanger Assembly for Radioisotope Stirling Space Power, Phase I

Potential Applications

The market for the RSG with ReHX will be initially focused on delivery of NASA space power systems.